

**UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MASSACHUSETTS**

<u>MICRO MOTION, INC.,</u>	)	
Plaintiff,	)	
	)	
v.	)	Civ. Action No. 09cv10319-NG
	)	
KROHNE, INC. and KROHNE	)	
MESSTECHNIK GMBH & CO. KG,	)	
<u>Defendants.</u>	)	
GERTNER, D.J.		

**MEMORANDUM AND ORDER RE: MARKMAN CLAIM CONSTRUCTION**  
**February 3, 2011**

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**I. INTRODUCTION**

This action concerns U.S. Patent No. 6,487,507 ("the '507 patent") (document #1-5), held by the plaintiff, Micro Motion, Inc. ("Micro Motion"). Micro Motion and defendants Krohne, Inc., and Krohne Messtechnik GmbH & Co. KG (collectively "Krohne") are manufacturers of Coriolis flowmeters, devices used to measure the mass flow rates of liquids and gases, including volatile materials, often used in explosive environments. These flowmeters are comprised of one or more flow tubes embedded with "pick-off sensors," along with a meter electronics unit that analyzes the signals from the pick-off sensors.

Historically, the meter electronics unit was located away from the flowmeter tubes, thus necessitating an expensive, custom-make nine-wire cable to connect the meter electronics unit to the tubes. The '507 patent describes a configuration for Coriolis flowmeters in which the meter electronics is split into two parts: the "signal conditioner" and a "host system." This alteration has two important consequences: First, the signal conditioner may be mounted directly on the flowmeter tubes in the hazardous area. Second, the host system can connect to the rest of the flowmeter with two- or four-wire cables, rather than a nine-wire cable.

Krohne employs two flowmeter configurations that allegedly infringe various claims of Micro Motion's patent. Krohne's two flowmeters apparently include a separated signal conditioner and host system. As a result, Micro Motion seeks damages for patent infringement and an injunction either preventing defendants' manufacture of its flowmeter or requiring a licensing fee. Krohne has counterclaimed for a declaratory judgment that the '507 patent is invalid.

Federal Circuit law provides that a court addressing patent validity and infringement questions should first "determine[] the meaning of disputed claim terms." Wavetronix LLC v. EIS Elec. Integrated Sys., 573 F.3d 1343, 1354 (Fed. Cir. 2009); see also Smiths Indus. Med. Sys., Inc. v. Vital Signs, Inc., 183 F.3d 1347, 1353 (Fed. Cir. 1999). Since claim construction is an issue of law that must be decided by a judge, Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-71 (Fed. Cir. 1995), the parties have submitted briefs regarding various disputed terms in the '507 patent, including "intrinsically safe" and "protection circuitry." Krohne further argues that because the "intrinsically safe" and "protection circuitry" terms are indefinite, the Court should rule the patent invalid pursuant to 35 U.S.C. § 112, ¶ 2. See Exxon Research & Eng'g Co. v. United States, 265 F.3d 1371, 1375 (Fed. Cir. 2001).

Both parties presented technical tutorials at a Markman hearing on July 28, 2010. Based on all of these materials, the Court construes the disputed terms "intrinsically safe" and "protection circuitry for" as described below. The Court also defers construction of the terms "remote" and "pick-off sensor," and denies Krohne's request to hold the patent invalid on indefiniteness grounds.

## **II. FACTS**

### **A. General Description of the Patent and Allegedly Infringing Design**

Scientists and engineers use flowmeters to measure various characteristics of liquids and gases, including mass flow rates. One type of device, a Coriolis flowmeter, takes advantage of the "Coriolis effect," a phenomenon in which moving objects viewed from a rotating reference frame appear to take a curved path. In a Coriolis flowmeter, an actuator causes tubes to vibrate; when material flows through the vibrating tubes, the tubes twist. Sensors located on the flow tube detect the degree of twist, which the patent specification refers to as the "phase difference." '507 Patent 1:46. The sensors then send signals to a separate set of electronic circuits, which can translate the phase difference data into mass flow rates (as well as volumetric flow rates, density, or viscosity). See generally Micro Motion, Inc. v. Exac Corp., 741 F. Supp. 1426, 1429-31 (N.D. Cal. 1990) (discussing the engineering principles behind Coriolis mass flowmeters and their early commercial history).

Prior to the '507 patent, Coriolis flowmeters measuring hazardous materials required a nine-wire cable to connect sensors to electronic circuits located in a separate area or in an explosion-proof container. See '507 Patent 1:51-63, 2:11-22. The '507 patent offers an alternative configuration in which the meter electronics are separated into two parts, a "signal conditioner" and a "host system." Id. at 6:51-53. The signal conditioner provides a preliminary analysis of the sensor signals. Id. at 3:1-10. Data from the signal conditioner then travels via a smaller two- or four-wire cable to a host system, which performs secondary signal processing and supplies power. Id. at 3:10-12, 3:49-55.

In this configuration, both the signal conditioner and the host system may be located in the same area as volatile materials. To avoid triggering an explosion, the patent discloses several types of protection circuitry that limit energy levels in excess of an "intrinsically safe" level. The signal conditioner, for example, includes circuitry designed to prevent power above a certain threshold from being applied to the wires between the signal conditioner and the host system ("host-side protection circuitry"). Id. at 3:16-19. The signal conditioner also includes circuitry with a similar function located between the signal conditioner and the flowmeter assembly ("flowmeter assembly protection circuitry"). Id. at 3:36-40. In addition, each component may contain additional circuitry for further protection. See id. at 3:26-48. Krohne employs two flowmeter configurations, both of which include a separated signal conditioner and host system.

#### **B. The Meaning of "Intrinsically Safe"**

The main dispute between the parties concerns the phrase "intrinsically safe," which the '507 patent repeatedly uses to describe aspects of the flowmeter configuration. The phrase appears in two ways: "intrinsically safe threshold" and "operating intrinsically safe." See, e.g. '507 Patent, claim 1. The patent offers various descriptions of the term, including:

An intrinsically safe device is a device in which all the circuitry in the device operates under a certain low energy level. By operating under a certain energy level, the device is ensured not to generate a spark or sufficient heat to cause an explosion even if the device fails in some manner. The power level needed to make a device intrinsically safe [is] determined by regulatory agencies such as UL [Underwriters Laboratories] in the United States, CENELEC [European Committee for Electrotechnical Standardization] in Europe, CSA [Canadian Standards Association] in Canada, and TIIS [Technology Institution of Industrial Safety] in Japan.

Id. at 2:36-45. Other than noting the existence of these various agencies and their standards, the patent does not specify precisely which agency's standard to apply or which version of its standards. Nor does the patent explain the testing protocol for evaluating safety in each case.

At the same time, the laws of physics provide an important limitation. In a flowmeter, the energy level present is a function of the open circuit voltage and electrical current. As a matter of physics, a minimum ignition level ("MIE") exists for every gas. Therefore, since an "intrinsically safe device is a device in which all the circuitry in the device operates under a certain low energy level," id. at 2:36-38, a level that ensures the device will not cause an explosion, id. at 2:38-40, the circuitry must operate at a level below the applicable MIE.

Krohne asserts that the "intrinsically safe" term is fatally indefinite. If, however, the Court finds that the term is not indefinite, Krohne proposes an interpretation of "intrinsically safe threshold" that refers to the standards issued by particular agencies. Micro Motion counters that "intrinsically safe" is not indefinite. In its view, the term is precise and clear to someone skilled in the art. "Intrinsic safety," it maintains, is a well-understood and universally accepted term.

### **C. The Meaning of "Protection Circuitry"**

The '507 patent explains that, in order to make the signal conditioner capable of being intrinsically safe, "the signal conditioner includes host-side protection circuitry and flowmeter assembly protection circuitry." Id. at 3:14-17. The parties do not provide suggested constructions of the "protection circuitry" term. Rather Krohne argues that, pursuant to 35 U.S.C. § 112, ¶ 6, "protection circuitry" must be treated as a means-plus-function limitation that would restrict the patent to circuit structures disclosed in the specification. See generally In re Donaldson Co., Inc., 16 F.3d 1189, 1194-95 (Fed. Cir. 1994) (en banc). Since the patent fails to

specify any specific circuit structures, Krohne requests that the Court also rule this term indefinite. Micro Motion responds that the term is not a means-plus-function limitation and that, thus, there is no basis for ruling it indefinite.

#### **D. Other Disputed Terms**

The parties also dispute the meaning of two other terms, "remote" and "pick-off sensor." See, e.g. '507 Patent, claims 1, 14, 23, 34 ("remote"); id., claims 1, 5, 14, 23, 27 ("pick-off sensor"). The word "remote" describes the location of the host system relative to the signal conditioner. Krohne requests that the Court simply give the term its plain meaning without further construction, while Micro Motion argues that the term should be construed to mean "physically divided."

A "pick-off sensor" gathers information from the flowmeter for processing by the signal conditioner and host system. Again, Krohne argues for application of the term's plain meaning. Micro Motion suggests that pick-off sensor means "a device which provides an output that allows the measurement of the oscillation of the conduit(s)." Pl.'s Prelim. Claim Construction Br. 18 (document #33). The Court will defer construction of these terms until summary judgment motions are filed.

### **III. ANALYSIS**

The novel feature of the '507 patent is the separation of the meter electronics into a "signal conditioner" and a "host system." This configuration creates two main benefits: First, it has the ability to operate the electronics of the flowmeter in an explosive environment. Second, it permits the elimination of expensive, custom-manufactured nine-wire cables for connecting the "host system" and the flow tubes.

### **A. Claim Construction Standard**

Claim construction is an issue of law that must be decided by a judge, rather than a jury. Markman, 52 F.3d at 970-71. The Court should construe terms in accordance with "ordinary and customary meaning," as understood by "a person of ordinary skill in the art in question." Phillips v. AWH Corp., 415 F.3d 1303, 1312-13 (Fed. Cir. 2005). When construing these terms, the Court should consider the entire patent, with particular emphasis on the patent specification. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996). In addition, the Court should look at the patent's prosecution history. Phillips, 415 F.3d at 1317. If a term's meaning is ambiguous in light of all of this intrinsic evidence, the Court may also analyze extrinsic evidence, including dictionaries, treatises, and expert statements. Id. at 1318-19, 1322-24.<sup>1</sup>

A patent's claims must be "definite," meaning that they must be "amenable to construction." Honeywell Int'l, Inc. v. ITC, 341 F.3d 1332, 1338 (Fed. Cir. 2003). A party arguing that a claim is indefinite must prove invalidity by clear and convincing evidence. Halliburton Energy Servs., Inc. v. M-I LLC, 514 F.3d 1244, 1249-50 (Fed. Cir. 2008). If the claim is so ambiguous that the Court cannot properly adopt a narrowing construction, then the claim is invalid pursuant to 35 U.S.C. § 112 ¶ 2. See Exxon, 265 F.3d at 1375.

Some patent terms describe a function (objective) instead of a specific means (method) for performing that function. These terms may be subject to "means-plus-function" limitations. See Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., 145 F.3d 1303, 1307-08 (Fed. Cir.

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<sup>1</sup> Although the Court may consider the device or process that allegedly infringes the patent in order to concentrate on relevant aspects of the claim, it "may not use the accused product or process as a form of extrinsic evidence to supply limitations for patent claim language." Wilson Sporting Goods Co. v. Hillerich & Bradsby Co., 442 F.3d 1322, 1331 (Fed. Cir. 2006).



1998). Courts must construe means-plus-function terms to include the particular structures in the specification that fulfill that function. 35 U.S.C. § 112, ¶ 6. A claim that includes the term "means" raises a rebuttable presumption that it is a means-plus-function limitation. Personalized Media Commc'ns, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 703 (Fed. Cir. 1998). Conversely, a claim that does not use the word "means" is presumptively not a means-plus-function limitation. Id. at 703-04.

**B. "Intrinsically Safe Threshold" and "Operating Intrinsically Safe"**

The energy present in a given flowmeter is a function of the open circuit voltage and the electric current. In order to avoid igniting the gases present within the flowmeter, the combination of voltage and current must produce an amount of energy that is less than the MIE for the most volatile gas present.<sup>2</sup> Thus, for any given voltage passing through an environment with a specific gas, there is a corresponding current that will produce the MIE. If the MIEs for a given gas are plotted on a graph with voltage on one axis and current on the other, the result is a minimum ignition curve for each gas. See Hohenstein Decl. ¶ 8 (document #35).

The principle underlying intrinsic safety is to prevent energy in excess of the amount needed to cause an explosion from building up in an environment that is potentially explosive. To be intrinsically safe, all electronic circuitry located in the explosive environment must be designed to limit the open circuit voltage or energy to a level that cannot ignite the explosive fuel/oxidizer mixture in the environment.

The '507 patent repeatedly uses the "intrinsically safe" term to describe certain aspects of the flowmeter configuration. See, e.g., '507 Patent, claim 1. As explained above, the phrase

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<sup>2</sup> For example, less energy is required to ignite hydrogen than propane. Hohenstein Decl. ¶ 18 (document #35).

appears in two forms: "intrinsically safe threshold" and "operating intrinsically safe." In two pertinent parts, the patent offers explanations for what the "intrinsically safe" term means. First, as quoted above:

An intrinsically safe device is a device in which all the circuitry in the device operates under a certain low energy level. By operating under a certain energy level, the device is ensured not to generate a spark or sufficient heat to cause an explosion even if the device fails in some manner. The power level needed to make a device intrinsically safe [is] determined by regulatory agencies such as UL [Underwriters Laboratories] in the United States, CENELEC [European Committee for Electrotechnical Standardization] in Europe, CSA [Canadian Standards Association] in Canada, and TIIS [Technology Institution of Industrial Safety] in Japan.

Id. at 2:36-45.<sup>3</sup> Similarly, the patents states: "The intrinsically safe threshold is the level of energy and/or power dictated by various agencies to ensure that a spark or heat from the circuitry does not ignite volatile material in the environment." Id. at 3:19-23.

Krohne argues that the terms "intrinsically safe threshold" and "operating intrinsically safe" are "insolubly ambiguous," see Honeywell, 341 F.3d at 1334, because the patent does not provide information necessary for a determination of whether any given device is intrinsically safe. This information, according to Krohne, includes the regulatory standard that should be applied and the laboratory and methodology to be used when applying that standard.

Micro Motion responds that an individual with ordinary skill in the art would clearly be able to determine the meaning of the term by applying identifiable external factors. I agree with Micro Motion that "intrinsically safe" is not indefinite.

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<sup>3</sup> Krohne's expert, David Hohenstein ("Hohenstein"), lists additional standards-setting entities: FM Approvals ("FM"), International Society of Automation ("ISA"), International Electrotechnical Commission ("IEC"), Standards Australia ("SAA/SA"), and GOST (a Russian standards body). Hohenstein Decl. ¶ 5 (document #35).

## **1. The Standards**

The descriptor, "intrinsically safe," is a term of art for the regulatory agencies as well as for those skilled in the art. Krohne's expert, David Hohenstein ("Hohenstein"), admits the concept of intrinsic safety has been around for "decades." Hohenstein Dep. 17:16, Mar. 22, 2010. He explains in his declaration:

[T]he term "intrinsic safety" refer to a system that has undergone an in-depth fault analysis to determine whether energy levels contained within the product are low enough to not cause an explosion when mounted or used within a hazardous (classified) location. This analysis takes into account the product's performance under normal and abnormal operating conditions. There also exist a number of other requirements for "intrinsic safety" including minimum circuit board trace spacing, mechanical construction, component temperature levels and markings.

Hohenstein Decl. ¶ 3. Indeed, Krohne's own product materials use the phrase "intrinsically safe." CSA International Certificate of Compliance (document #33-4); OPTIMASS Guidelines for the Use of Coriolis Meters in Hazardous Areas 8 (document #33-5).

Regulatory agencies throughout the world promulgate standards to apply to the "in-depth fault analysis" used to certify that devices, like flowmeters, are intrinsically safe and can be operated safely in explosive environments. In the United States, certification agencies include UL (Underwriters Laboratories) and FM (Factory Mutual). Hohenstein Decl. ¶ 2. According to Hohenstein, "UL has historically been the most stringent North American agency when it comes to application of intrinsic safety requirements while FM is normally considered the most knowledgeable concerning intrinsically safe circuits." Id. ¶ 14. In other countries, laboratories test intrinsic safety based on standards adopted by the CSA, CENELEC, IEC, TIIS, SAA/SA, and GOST. See Def.'s Opening Claim Construction Br. 6-7 (document #34) (citing various

foreign authorities). Given the different variables that these agencies apply, the varying testing methods they employ, the subjective factors they incorporate, and the "safety factors"<sup>4</sup> they apply, a device that would be certified as intrinsically safe by one agency might not be by another. See Hohenstein Decl. ¶¶ 5-16.

While these standards sometimes produce disparate certifications, their similarities outweigh their differences. As the '507 patent highlights, the disclosed circuitry is designed to enable the flowmeter to operate under "a certain energy level," an amount of energy "ensured not to generate a spark or sufficient heat to cause an explosion." This "certain energy level" is not ethereal or shifting. It is the MIE; it is a matter of physics. All the agencies set intrinsic safety standards that limit energy to levels below the ignition curve dictated by the MIE. If the combination of voltage and electrical current allowed under each of these standards were plotted on a graph, they would all fall below the curve. No matter what agency is certifying a device, or the standard it uses, or the laboratory equipment it employs, if a device is deemed "intrinsically safe" by an agency, that means that it is been certified as operating at a power level below the MIE for the gaseous environment in the flowmaker.

## **2. Determining Applicable Standard(s)**

To determine whether a given device is intrinsically safe under the '507 patent, one must first determine and then apply two different factors: 1) the agency standard and testing laboratory; and 2) the gaseous environment present in the flowmeter. The gaseous environment is a matter of science: either a gas is or is not present. The applicable standard is a matter of

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<sup>4</sup> A "safety factor" is a multiplier applied to the overall energy of the device before comparing it to the ignition curve. Hohenstein Decl. ¶¶ 6-7. For instance, if an agency requiring a safety factor of 2.0 were testing a device, that agency would not certify it as intrinsically safe unless the energy present could be doubled and still fall below the MIE.

regulation at the heart of the instant claim construction.

Krohne's own expert has explained the process for "determining what standards" to apply:

It may be based on the application, where it's located, what approval agency has, in essence, jurisdiction in that particular city or community. . . . Depending on where it's used, different agencies have more strength or more recognition. Some certification agencies have more strength or recognition in a certain application or a given community around the country. . . . [W]hether it's a refinery or a chemical plant may have different rules of which agency they most recognize.

Hohenstein Dep. 22:5-22. Similarly, Micro Motion's expert Arthur Zatarain ("Zatarain") says that a person of ordinary skill in the art can "determine" which standard to apply "[b]y going to whatever the regulatory bodies are for that particular situation, be they governmental, industry or customer." Zatarain Dep. 171:2-:4, Mar. 26, 2010 (document #39-1). The applicable regulatory body "depend[s] on the nature of that particular installation. The customer may specify it or the government may do it when you go to get a permit or something. . . . When you're working in a particular area, you know what the requirements are just because you do work there." *Id.* at 170:10-15. In other words, once the nature of the device and the "jurisdiction" in which it is used is known, one skilled in the art can discern the applicable agency standard or standards.<sup>5</sup>

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<sup>5</sup> Krohne argues that for apparatus claims, the scope cannot depend on the location in which the device will be used. In support, Krohne cites two cases: Marrin v. Griffin, 599 F.3d 1290 (Fed. Cir. 2010), and In re Kahn, 441 F.3d 977, 984 (Fed. Cir. 2006). However, Krohne's reliance on these cases is misplaced. The Federal Circuit has stated that "generally patentability 'depends on the claimed structure, not on the use or purpose of that structure.'" Marrin, 599 F.3d at 1294 (quoting Catalina Mktg. Int'l v. Coolsavings.com, Inc., 289 F.3d 801, 809 (Fed. Cir. 2002)); see also In re Kahn, 441 F.3d 977, 984 (Fed. Cir. 2006). In both, the court espoused this principle in connection with discussions of whether intended use mattered to the scope of an invention in general, not whether an invention could be patentable if there were differences in the claimed scope defined by the regulatory environment. For instance, in Marin, the Federal Circuit addressed a patent that disclosed a "scratch-off label for permitting a use to write thereon without the use of a marking implement." 599 F.3d at 1292. Since there existed prior art disclosing scratch-off devices, the plaintiff argued that the "for permitting" language should have been construed as a limitation on the scope of the claim – a limitation that the prior art did not anticipate. *Id.* at 1293-94. In holding the patent invalid, the Federal Circuit said that "use descriptions such as this are rarely treated as claim limitations. . . .

Once the applicable standard or standards for a given geographic location are determined, one may then apply it or them to the gaseous environment present in the relevant flowmeter.

### **3. Multiple Standards, Intrinsic Safety & Honeywell**

Krohne claims that one skilled in the art cannot know whether or not a flowmeter is intrinsically safe and thus covered by the '507 patent if more than one standard is applicable in a given location. After all, a device could be certified as intrinsically safe under one but not the other. However, Krohne's argument overstates the problem. The patent is predominately focused on disclosing a circuitry that operates under "a certain energy level . . . ensured not to generate a spark or sufficient heat." '507 Patent 2:38-39. As noted above, "certain energy level" is simply the MIE; all standards limit the energy to a level below the ignition curve. Therefore, a device that is intrinsically safe under *any* agency standard applicable to a given device in a specified area is covered by the '507 patent. See Zatarain Dep. 146:12-15.

This holding is not at odds with the Federal Circuit's decision in Honeywell, 341 F.3d at 1339-41. In Honeywell, the court affirmed a final determination by the U.S. International Trade Commission that claims in Honeywell's patent were indefinite because they did not identify which testing method should be used at a specific stage in the manufacturing process for automobile tires. The patent at issue disclosed a process for production of a multifilament polyester product. Id. at 1334. The patented process required that "[a]t each stage, the temperature and physical manipulation of the material [were] carefully controlled to achieve a specific morphology." Id. The dispute in the case centered on the method of measuring the

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'[P]reamble language that merely states the purpose or intended use of an invention is generally not treated as limiting the scope of the claim.'" Id. at 1294 (quoting Bicon, Inc. v. Straumann Co., 411 F.3d 945, 952 (Fed. Cir. 2006)).

melting point elevation ("MPE") during the manufacturing process. Id. at 1335-36. While the patent described one approach to measure MPE, it did not specify which of four possible methods must be used to prepare the substance for that approach. Id. at 1336. Notably, the MPE levels depended on the method used to prepare the sample; a substance may have fallen within the asserted claims using one method but not another. Id. at 1339.

The Federal Circuit refused to adopt a construction that the substance infringed if it met MPE requirements using an "all methods" approach. Id. at 1341-42. It also rejected the possibility of infringement for meeting MPE requirements with an "any one method" approach. Id. at 1341. The court instead ruled the claims indefinite, reasoning that "[c]ompetitors trying to practice the invention or to design around it would be unable to discern the bounds of the invention." Id. at 1341.

Honeywell, however, is distinguishable. First, the choice of the temperature testing method in Honeywell significantly affected the final product. The final yarn would be different depending on what standard was used to calculate the MPE. Id. at 1340. The evidence showed not simply that there were multiple methods for determining the melting point of the yarn, but also that the methods known in the art yielded *significantly* different results. In the instant case, the basic configuration of the flowmeter's circuitry is the same regardless of the regulatory standard applied. And to the extent there are differences, they are minor, with all standards falling below the MIE level.

Second, in Honeywell, to choose a specific testing method or to allow "any one method" was arbitrary, while an "all method" construction would "render the invention inoperable." Id. at 1341. Without knowing which method to use, competitors could not know whether their yarns

fell inside or outside the patent -- i.e., whether they were infringing or designing around it. Id. at 1341. Not so here. The standards are known, easily ascertainable, and do not materially change the device.<sup>6</sup> One skilled in the art is familiar with the process of obtaining intrinsic safety certification. In fact, there is an entire industry built around obtaining this type of certification.

Indeed, this case is more like PPG Indus. v. Guardian Indus., Corp., 75 F.3d 1558 (Fed. Cir. 1996). In PPG Indus., the claims involved a tinted, ultraviolet-absorbing glass having an ultraviolet transmittance of 31% or less. The infringer argued that the claims were indefinite because the patentees failed to specify which of several conventional methods should be used to measure the ultraviolet transmittance. The court found that the multiplicity of methods made no difference because they all yielded essentially the same result. Id. at 1563.

#### **4. Indefiniteness**

Pursuant to 35 U.S.C. § 112, ¶ 2, a patent must be definite, "particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." Because a claim is presumptively valid, a claim is indefinite only if the "claim is insolubly ambiguous and no narrowing construction can properly be adopted." Exxon, 265 F.3d at 1375. Furthermore, the definiteness requirement of 35 U.S.C. § 112 "focuses on whether the claims, as interpreted in view of the written description, adequately perform their function of notifying the public of the [scope of the] patentee's right to exclude." S3 Inc. v. nVIDIA Corp., 259 F.3d 1364, 1372 (Fed.

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<sup>6</sup> In fact, many devices are intrinsically safe under all or many standards. Notably, Krohne cites a 1992 article by Chris Towle, The Effect of IEC and CENELEC Intrinsic Safety Standards on the Future Development of Instrumentation (1992), on differing standards for intrinsic safety. Def.'s Opening Claim Construction Br. 5. The article says: "[I]ntrinsic safety is the only technique which *does* permit a single design to meet the requirements of all countries . . . ." Towle, supra, at 2.



Cir. 2001). In this case, Krohne has not proven by clear and convincing evidence that the public would not understand the novelty protected by Micro Motion's patent.

The invention disclosed by the '507 patent is not framed by this one issue, the intrinsically safe standard. Rather, the patent describes an arrangement of electronic circuitry and wiring for a Coriolis flowmeter that obviates the need for a nine-wire cable and allows the electronics to be located in an explosive environment. Regardless of the safety standard against which the device is tested, the novel circuitry configuration remains the same.

Most important, as explained above, a person skilled in the art can discern whether a device in a specific jurisdiction is covered by the '507 Patent. See Exxon, 265 F.3d at 1375 ("If the meaning of the claim is discernable, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, . . . the claim [is] sufficiently clear to avoid invalidity on indefiniteness grounds."); see also Marley Mouldings Ltd. v. Mikron Indus., Inc., 417 F.3d 1356, 1360 (Fed. Cir. 2005) ("[§ 112(6)] is satisfied when the relevant values can be 'calculated or measured.'"); Verve, LLC v. Crane Cams, Inc., 311 F.3d 1116, 1119 (Fed. Cir. 2002) ("[T]he patentee is not required to include in the specification information readily understood by practitioners, lest every patent be required to be written as a comprehensive tutorial and treatise for the generalist, instead of a concise statement for persons in the field.").<sup>7</sup>

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<sup>7</sup> This decision is consistent with previous decisions by the Federal Circuit, most notably Orthokinetics, Inc. v. Safety Travel Chairs, Inc., a case that dealt with a patent for a pediatric wheelchair used to enter and exit cars. 806 F.2d 1565, 1568 (Fed. Cir. 1986). In Orthokinetics, the patent disclosed a collapsible pediatric wheelchair that facilitated the placing of wheelchair-bound persons in a car. Id. at 1568. At issue was the part of a claim that described the front leg portion as being "so dimensioned as to be insertable through the space between the doorframe of an automobile and one of the seats thereof." Id. The patent, however, did not disclose specific cars or specific dimensions. Rather, the patents required "that one desiring to build and use a travel chair must measure the space between the selected automobile's doorframe and its seat and then dimension the front legs of the travel chair so they will fit in that particular space in that particular automobile." Id. at 1576. The Federal Circuit concluded that the

## 5. Construction

Micro Motion advocates for "intrinsically safe threshold" to be construed as meaning "the level of energy and/or power required to ensure that the device does not generate a spark or sufficient heat to cause an explosion," and "operating intrinsically safe" to be construed as meaning "operating below the energy and/or power level required to ensure that the device does not generate a spark or sufficient heat to cause an explosion." Pl.'s Opening Claim Construction Br. 12, 15. Conversely, Krohne proposes that the term "intrinsically safe" be interpreted in accordance with the one statement in the patent about regulatory bodies: "the level of energy and/or power dictated by various agencies such as UL, CENELEC, CSA, and TIIS, to ensure that a spark or heat from the circuitry does not ignite volatile material in the environment." For the reasons explained above, I am adopting Krohne's language. To be clear, that means that the level of energy and/or power must be allowed by *any one* of the applicable agencies.

### C. "Protection Circuitry"

The '507 patent uses the term "protection circuitry" throughout multiple claims. The use of the term in claim 1 is illustrative:

In order to make the signal conditioner capable of being intrinsically safe, the signal conditions includes host-side **protection circuitry** and **flowmeter assembly protection circuitry**. The **host side protection circuitry** prevents energy

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term "so dimensioned" was not indefinite because someone skilled in the art could easily measure the appropriate dimensions. Id. Specifically, the court held: "That a particular chair on which the claims read may fit within some automobiles and not others is of no moment. The phrase 'so dimensioned' is as accurate as the subject matter permits, automobiles being of various sizes." Id. The instant case and Orthokinetics have several important similarities. First, in Orthokinetics, like the instant matter, the critical disclosure in the patent was the novel design, not the contexts in which the novel design could achieve its purpose. Second, the dimensions of the car in Orthokinetics are an analogous factor in establishing the scope of the patent to the standards in the instant case. That a given chair in Orthokinetics might function with one car but not another was "of no moment." Id. Similarly, that a flowmeter in one geographic area may be covered by the '507 patent but not in another jurisdiction does not render the patent indefinite.

and/or power in excess of an intrinsically safe threshold from being applied by the signal conditioner to the leads connecting the signal conditioner to the host system. . . . The **host-side protection circuitry** may include power supply protection circuitry and/or signaling protection circuitry. . . . The power barrier circuitry prevents power from flowing from the signal conditioner over the first wire and the second wire supplying power to the signal conditioner. The **signaling protection circuitry** prevents power in excess of the intrinsically safe threshold from being applied by the pick-off signal conditioner circuitry in the signal conditioner to the leads connecting the pick-off signal condition circuitry to the host system. The **flowmeter assembly protection circuitry** may include a drive signal protection circuitry and sensor signal protection circuitry. . . . The barrier may include **power supply protection circuitry** and **secondary processing protection circuitry**. . . . [H]ost-side protection circuitry includes **signal protection circuitry** in the signal conditioner . . . . [F]lowmeter assembly protection circuitry includes **drive protection circuitry** in the signal conditioner that prevent power in excess of the intrinsically safe threshold from being applied by the drive circuitry to leads connected to the driver.

'507 Patent 3:14-4:42 (emphasis added).

Arguing that the specification does not disclose any structure, circuit architecture, or arrangement of circuit components and that the term "protection circuitry" does not have independent meaning to a person skilled in the art, Krohne claims that "protection circuitry" should be treated as a means-plus-function term under 35 U.S.C. § 112, ¶ 6. That treatment would limit the patent to particular structures described in the specification that fulfill that function. And since there are no structures described in the patent, the claims are invalid.

Micro Motion counters that the term "circuitry" itself connotes structure, and that the "protection" qualifier only offers additional details about the structure. For the reasons explained below, I hold that "protection circuitry" is not subject to a means-plus-function limitation because, as Micro Motion describes, this term connotes a circuitry structure that limits energy to

certain levels. Since the term is not in means-plus-function form, there is no basis for ruling the claims invalid.

### **1. Presumption Against Means-Plus-Function Limitation**

The term "protection circuitry" is entitled to a rebuttable presumption that it is not a means-plus-function term because it does not contain the term "means." See Lightning World, Inc. v. Birchwood Lighting, Inc., 382 F.3d 1354, 1358 (Fed. Cir. 2004). In fact, the Federal Circuit has "seldom held that a limitation not using the term 'means' must be considered to be in means-plus-function," id. at 1362, and has insisted that "'the circumstances must be [unusual] to overcome the presumption,'" M.I.T. v. Abacus Software, 462 F.3d 1344, 1356 (Fed. Cir. 2006) (citing Lightning World, 382 F.3d at 1362). In this case, the '507 patent does not use the magic word, and so to defeat this presumption, Krohne must produce sufficient evidence that individuals skilled in the art would not understand the language of the claims as designating structure. Lightning World, 382 F.3d at 1359-60.

### **2. Structure**

As Krohne notes, the term "protection circuitry" itself "does not connote any *specific* structure or arrangement of circuit components." Hohenstein Decl. ¶ 28 (emphasis added). Indeed, Micro Motion's own expert was not aware of any particular component or arrangement of components that is characteristic of "protection circuitry." Zatarain Dep. 16:2-17:3. Nor does the '507 patent offer a detailed description of exactly how the circuits must be arranged. This fact, however, is not fatal, as a general term connoting structure need not describe a "specific structure" to avoid means-plus-function treatment. Lightning World, 382 F.3d at 1359.

In Lighting World, the Federal Circuit explained that a term need only designate a "broad class of structures" to foreclose means plus function treatment, "even if the term identifies the structures by their function." Id. at 1360. In this case, the '507 patent does just that, with various claims describing the purpose of the particular protection circuitry at issue, such as "prevent[ing] energy and/or power in excess of an intrinsically safe threshold from being applied by the signal conditioner to the leads connecting the signal conditioner to the host system." '507 Patent 3:17-20. Moreover, as Zatarain explains, "protection circuitry" is characterized by certain "features or traits," including "the current limiting and voltage limiting aspects which would then reduce a maximum power," and "some physical construction requirements that have to do with fault tolerance and reliability aspects," along with the "materials that are used and the construction methods used." Zatarain Dep. 17:4-19.

Indeed, Krohne's own expert has testified that there is "protective circuitry within" products manufactured by his employer,<sup>8</sup> Pepperl + Fuch, Inc.<sup>9</sup> Hohenstein Dep. 60:16-21. Similarly, as of April 16, 2010, the terms "protection circuitry" and "protection circuit" appeared in 14,987 patents, including 4,000 in which one of those terms was in the claims. See Aaron S. Jacobs Decl. ¶ 10. In fact, patents assigned to Hohenstein's employer, Pepperl & Fuchs, use the terms "protection circuitry" and "protective circuit." U.S. Patent No. 7,463,470 ("470 patent") 1:36-42 (document #41-3); U.S. Patent No. 7,557,548 ("548 patent") 11:17-18 (document #41-4). Despite Krohne's contention to the contrary, the term "protection circuitry" is used in these patents to denote circuits that limit voltage, current, or energy levels. See '470 patent

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<sup>8</sup> The "intrinsic safety barriers" produced by Pepperl & Fuch.

<sup>9</sup> Pepperl & Fuch is a "a worldwide leader in process and factory automation, including 'intrinsic safety' barriers and 'intrinsically safe' equipment," Hohenstein Decl. ¶ 2.

1:36-42 (explaining that a high voltage could be ameliorated by "incorporating protection circuitry that either limits that current that can flow into the fuse or limits the voltage on the zener diodes."); '548 patent 11:17-18 (claiming "[a] protective circuit for limiting a voltage or a current of a load"); see also U.S. Patent No. 7,091,631 6:19-24 (document #41-5) (describing "[a] device for intrinsically safe, redundant current/voltage supply . . . with a protective device for intrinsically safe power limitation").

Likewise, a trilogy of Federal Circuit cases found that "circuit" or "circuitry" were not means-plus-function terms. Most recently and most relevantly in M.I.T. v. Abacus Software, the court held that "'aesthetic correction circuitry' connotes sufficient structure to avoid" a means-plus-function limitation in a color processing patent. 462 F.3d 1344, 1355 (Fed. Cir. 2006). In so doing, the court notes that in "contrast to the term 'mechanism,' dictionary definitions establish that the term 'circuitry,' by itself, connotes structures." Id. (citing Webster's Third New International Dictionary, 408-09 (1968 ed.) (defining "circuit as 'the complete path of an electric current including any displacement circuit' and 'circuitry' as the 'detailed plan of an electric circuit or network'")).<sup>10</sup> In Linear Tech Corp. v. Impala Linear Corp., the court concluded that "first circuit" and similar terms were not means-plus-function limitations. 379 F.3d 1311, 1320 (Fed. Cir. 2004). That case provided more information about the circuit's operation, including mention of "switching transistors" and a control signal that was "responsive to a first feedback signal." Id. Finally, in Apex, Inc. v. Raritan Computer, Inc., the court explained, "while we do not find it necessary to hold that the term 'circuit' by itself always

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<sup>10</sup> Krohne relies heavily on a dissent in the case that rejected the majority's reasoning and said "aesthetic correction" would not "connote sufficiently definite structure." Id. at 1362 (Michel, J., dissenting). The majority clearly did not require "definite structure;" it instead stated that a term covering a broad class of structures would be sufficient. Id. at 1356.

connotes sufficient structure, the term 'circuit' with an appropriate identifier such as 'interface,' 'programming' and 'logic,' certainly identifies some structural meaning to one of ordinary skill in the art." 325 F.3d 1364, 1373 (Fed. Cir. 2003). The court went on to hold that the terms "first interface circuit" and "second interface circuit" were not means-plus-function terms because "interface circuit" had a dictionary definition. Id. at 1374.<sup>11</sup>

Since Krohne cannot overcome the presumption that "protection circuitry" is not a means-plus-function term and Krohne offers no other infirmity with the term, it is not indefinite.

#### IV. CONCLUSION

For the forgoing reasons, I **DENY** Krohne's request to hold that either "intrinsically safe" or "protection circuitry" is definite; construe the term "intrinsically safe" to mean the level of energy and/or power allowed by any applicable standard for the jurisdiction in which the device is used to ensure that a spark or heat from the circuitry does not ignite volatile material in the environment; and defer construction of the terms "remote" and "pick-off sensor."

**SO ORDERED.**

**Date: February 3, 2011**

/s/ Nancy Gertner

**NANCY GERTNER, U.S.D.J.**

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<sup>11</sup> Krohne reads Linear Tech and Apex as requiring that the term "circuitry" includes an "adjectival qualifier" that "define[s] sufficiently definite structure." Def.'s Opening Claim Construction Br. 21 (document #34). Further, Krohne claims that the '507 patent lacks the necessary "qualifying language." Id. This argument is unpersuasive for several reasons. First, as quoted above, the court in MIT explicitly stated that "'circuitry' by itself connotes structure." MIT, 462 F.3d at 1355. Second, the '507 patent has an adjectival qualifier: "protection". The adjectival qualifier "protection" limits the possible types of circuits. Although "protection" is a functional term, it limits the types of possible structures to circuits that are able to limit energy levels. See Zatarain Dep. 17:4-17:25. Moreover, the patent often employs the "protection circuitry" term in conjunction with additional descriptions of the circuits' functions, including "host-side," "flowmeter assembly," "power supply," "signaling," "drive," and "sensor." Therefore, Apex and Linear Tech do not support a holding that "protection circuitry" merits means-plus-function treatment.